

## LIST OF CONTENTS

### VOLUME 43, NUMBER 1, 1989

#### 1 Editorial

#### Articles

- |   |    |  |
|---|----|--|
| <b>W. E. Alnaser</b> ( <i>Bahrain</i> )   | 3  | Characteristics of the available wind energy in Bahrain  |
| <b>D. Sragovich</b> ( <i>Israel</i> )   | 7  | Transient analysis for designing and predicting operational performance of a high temperature sensible thermal energy storage system |
| <b>A. Akbarzadeh</b> ( <i>Australia</i> )   | 17 | Convective layers generated by side walls in solar ponds: observations   |
| <b>H. Rubin and G. A. Bemporad</b> ( <i>Israel</i> )  | 25 | Analysis of turbulent flow in thermal layers of the advanced solar pond (ASP)  |
| <b>H. Rubin and G. A. Bemporad</b> ( <i>Israel</i> )  | 35 | The advanced solar pond (ASP): basic theoretical aspects   |
| <b>A. Argiriou, R. Pasquetti, F. Papini, A. Arconada, and M. Audibert</b> ( <i>France</i> ) | 45 | Thermal study of the receiver of a focusing solar collector using infrared thermography  |
| <b>J. R. Hull, D. L. Bushnell, D. G. Sempsrote, and A. Pena</b> ( <i>U.S.A.</i> )           | 57 | Ammonium sulfate solar pond: observations from small-scale experiments   |

#### 65 Books Received

### VOLUME 43, NUMBER 2, 1989

#### Articles

- |   |     |   |
|---|-----|---|
| <b>H. S. Jarosch</b> ( <i>Israel</i> )                          | 67  | Estimation of parameters for a solar furnace  |
| <b>R. N. Chapman</b> ( <i>U.S.A.</i> )                          | 71  | Development of sizing nomograms for stand-alone photovoltaic/storage systems                            |
| <b>A. Longhetto, G. Elisei and C. Giraud</b> ( <i>Italy</i> )   | 77  | Effect of correlations in time and spatial extent on performance of very large solar conversion systems |
| <b>P. A. Hobson and B. Norton</b> ( <i>U.K.</i> )               | 85  | A design nomogram for direct thermosyphon solar-energy water heaters                                    |
| <b>K. G. T. Hollands and M. F. Lightstone</b> ( <i>Canada</i> ) | 97  | A review of low-flow, stratified-tank solar water heating systems                                       |
| <b>H. C. Hottel</b> ( <i>U.S.A.</i> )                           | 107 | A review paper—Fifty years of solar energy research supported by the Cabot Fund                         |

VOLUME 43, NUMBER 3, 1989

*Articles*

- |  |  |
|--|--|
| <b>Y. Jaluria and B. T. O'Mara</b><br>(U.S.A.)                           | 129 Thermal field in a water body for solar energy storage and extraction due to a buoyant two-dimensional surface water jet |
| <b>H. Tributsch</b> (F.R.G.)   | 139 Feasibility of toxic chemical waste processing in large scale solar installations  |
| <b>J. M. Huacuz, F. Sierra, C. Venegas, and C. Ramos</b><br>(Mexico)     | 145 Development of a submersible shadowgraph for the study of interfaces in salt-gradient solar ponds                        |
| <b>J. A. Davies and D. C. McKay</b> (Canada)                             | 153 Evaluation of selected models for estimating solar radiation on horizontal surfaces                                      |
| <b>M. A. Hassab, I. A. Tag, W. A. Kamal, and F. M. Al-Noaimi</b> (Qatar) | 169 Problems encountered in operating salt gradient solar ponds in the Arabian Gulf region                                   |
| <b>F. Vignola and D. K. McDaniels</b> (U.S.A.)                           | 183 Direct radiation: Ratio between horizontal and tilted surfaces   |

VOLUME 43, NUMBER 4, 1989

*Articles*

- |   |   |
|---|---|
| <b>L. C. Spencer</b> (Australia)        | 191 A comprehensive review of small solar-powered heat engines: Part I. A history of solar-powered devices up to 1950               |
| <b>L. C. Spencer</b> (Australia)        | 197 A comprehensive review of small solar-powered heat engines: Part II. Research since 1950—"conventional" engines up to 100 kW    |
| <b>L. C. Spencer</b> (Australia)        | 211 A comprehensive review of small solar-powered heat engines: Part III. Research since 1950—"unconventional" engines up to 100 kW |
| <b>F. J. Newland</b> (Hong Kong)        | 227 A study of solar radiation models for the coastal region of South China   |
| <b>M. Farid and K. Yacoub</b><br>(Iraq) | 237 Performance of direct contact latent heat storage unit  |

VOLUME 43, NUMBER 5, 1989

*Articles*

- |   |   |
|---|---|
| <b>C. Gueymard</b> (Canada)   | 253 A two-band model for the calculation of clear sky solar irradiance, illuminance, and photosynthetically active radiation at the earth's surface |
| <b>B. Norton</b> (N. Ireland),<br><b>D. E. Prapas</b> (Greece),<br><b>P. C. Eames, and S. D. Probert</b> (U.K.) | 267 Measured performances of curved inverted-Vee, absorber compound parabolic concentrating solar-energy collectors                                 |
| <b>M. A. Rosen, F. C. Hooper, and A. P. Brunger</b> (Canada)  | 281 The characterization and modelling of the diffuse radiance distribution under partly cloudy skies   |

- |   |  |
|---|--|
| <b>H. Wiener, B. Zaidman,</b><br>and <b>Y. Sasson</b> ( <i>Israel</i> )   | 291 Storage of energy by solutions of alkali formate salts   |
| <b>G. Lewis</b> ( <i>U.S.A.</i> )   | 297 The utility of the Angstrom-type equation for the estimation of global irradiation                                     |
| <b>H. S. Sahsamanoglou</b> and<br><b>A. A. Bloutsos</b> ( <i>Greece</i> ) | 301 Solar radiation reduction by water and dust in the area of Thessaloniki  |
| <b>B. G. Patil</b> and<br><b>G. T. Ward</b> ( <i>New Zealand</i> )        | 305 Simulation of solar air drying of rapeseed   |
| <i>Letters to the Editor</i>  |  |
| <b>D. L. Evans</b> ( <i>U.S.A.</i> )                                      | 321 Comments on <i>Load/weather/insolation data base for estimating photovoltaic array and system performance in Egypt</i> |
| <b>E. El-rafeey</b> and<br><b>M. El-sherbiny</b> ( <i>Egypt</i> )         | 321 Reply to comments by D. L. Evans   |
| <b>J. J. Michalsky</b> ( <i>U.S.A.</i> )                                  | 323 <i>Errata</i>  |

# VOLUME 43, NUMBER 6, 1989

## Articles

- |  |  |
|--|--|
| <b>F. J. K. Ideriah</b> and<br><b>S. O. Suleman</b> ( <i>Nigeria</i> )                         | 325 Sky conditions at Ibadan during 1975–1980  |
| <b>M. T. Y. Tadros</b> and<br><b>M. A. M. Shaltout</b> ( <i>Egypt</i> ),                       | 331 Effect of Hanning and Parzen windows and Kalman filter on the spectral analysis of solar constant and solar activities                             |
| <b>H. Suehrcke</b> and<br><b>P. G. McCormick</b> ( <i>Australia</i> )                          | 339 Solar radiation utilizability  |
| <b>D. R. Myers</b> ( <i>U.S.A.</i> )   | 347 Estimates of uncertainty for measured spectra in the SERI spectral solar radiation data base   |
| <b>I. A. Raja</b> and<br><b>J. W. Twidell</b> ( <i>U.K.</i> )                                  | 355 Distribution of global insolation over Pakistan  |
| <b>T. Feuillard, J.-M. Abillon,</b><br>and <b>R. Bonhomme</b><br>( <i>French West Indies</i> ) | 359 Relationship between global solar irradiation and sunshine duration in Guadeloupe  |
| <b>T. Feuillard, J.-M. Abillon,</b><br>and <b>C. Martias</b><br>( <i>French West Indies</i> )  | 363 The probability density function $P(K_n, \bar{K}_n)$ of the clearness index: A new approach  |
| <b>I. Morales</b> and<br><b>F. F. de la Rosa</b> ( <i>Spain</i> )                              | 373 Continuous photosynthetic production of hydrogen peroxide by the blue-green algae <i>Anacystis nidulans</i> R2 as a way to solar energy conversion |
| <b>J. L. Wright</b> and<br><b>K. G. T. Hollands</b> ( <i>Canada</i> )                          | 379 Radiant and free convective heat transfer through a pleated (V-corrugated) plastic film  |
| <b>S. Coppolino</b> ( <i>Italy</i> )   | 385 A simple model for computing diffuse solar radiation   |
|  | 393 Volume 43, 1989—List of Contents and Author Index  |